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Design of a Novel Inclination Sensor Utilizing Grayscale Image

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Abstract : Several research works have been done in recent times utilizing grayscale image for the measurement of many physical phenomena. In this present paper, we have designed an embedded based inclination sensor utilizing the grayscale image with a resolution of 0.3º. The sensor module consists of a circular shaped metal disc, laminated with grayscale image and an optical transreceiver. The sensor principle is based on temporal changes in light intensity by the movement of grayscale image with the inclination of the target surface and the variation of light intensity has been detected in terms of voltage by the signal processing circuit (SPC).The output of SPC is fed to a microcontroller program to display the inclination angel digitally. The experimental results are shown a satisfactory performance of the sensor in a small inclination measuring range of -40º to + 40º with a sensitivity of 62 mV/°.

Keywords : Grayscale image, Inclination Sensor, Microcontroller Program, Signal Processing Circuit.
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